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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/332,264	06/11/1999	THOMAS HUNTINGTON WOOD	WOOD27/56115	2709

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EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/332,264

Applicant(s)

WOOD, THOMAS HUNTINGTON

Examiner

Shi K. Li

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 and 7-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-2, 4-5, 7, 10 and 12-15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. (U.S. Patent 5,311,344) in view of Lewin et al. (U.S. Patent 6,587,476 B1).

Bohn et al. discloses in FIG. 1 a data communication system comprising a head-end 2, a splitter 3, a first network unit 5₁ and a second network unit 5₂. The difference between Bohn et al. and the claimed invention is that (a) Bohn et al. does not include an Ethernet adapter circuit in the head-end; and (b) Bohn et al. does not teach the Ethernet interface for providing the upstream data.

Ethernet is a popular network interface and can be found in most computers for interconnecting with other computers. Lewin et al. emphasizes the fact in "Background of the Invention" Section and teaches in FIG. 1 the use of 10 BaseT Ethernet interfaces for receiving data from subscribers. Lewin et al. also teaches in FIG. 7 the use of an Ethernet switch to combine the data from individual subscribers. One of ordinary skill in the art would have been motivated to combine the teaching of Lewin et al. with the data communication system of Bohn et al. to use Ethernet interface for receiving subscriber data because Ethernet interfaces are popularly found in home and office computers, and to include a Ethernet switch in the head-end for combining data from individual subscribers because the Ethernet switch provides high bandwidth duplex data communication for each subscriber and allows the interconnection to other networks. In

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using Ethernet switch, there is no collision between the different ports. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Ethernet interface for receiving upstream data and include a Ethernet switch in the head-end for combining data from individual subscribers and interconnecting to other networks, as taught by Lewin et al., in the data communication system of Bohn et al. because Ethernet interfaces are popularly equipped in most home and office computers.

Regarding claim 2, Bohn et al. uses subcarrier technology as described in col. 4, lines 39-65.

Regarding claim 4, Bohn et al. uses optical fibers for connecting the network units and the splitter. Therefore the network units are optical network units.

Regarding claim 5, the modified data communication system of Bohn et al. and Lewin et al. would use Ethernet data format, which is a packet format, for the data.

Regarding claims 7 and 12, the modified data communication system of Bohn et al. and Lewin et al. would include an Ethernet adapter, a modulator (VCO 57 of FIG. 2 of Bohn et al.) and a transmitter (laser 55 of FIG. 2 of Bohn et al.).

Regarding claim 10, Bohn et al. suggests the use of FSK in col. 4, line 61.

Regarding claim 13, Bohn et al. includes in FIG. 1 downstream data to the network units.

Regarding claim 14, Bohn et al. suggests in FIG. 1 that the head-end includes a transmitter 23, a receiver 24 and a wavelength-division multiplexing device (coupler 21). Bohn et al. also suggests in FIG. 2 that each network unit includes a transmitter 55, a receiver 52 and a wavelength-division multiplexing device 51.

Regarding claim 15, Bohn et al. suggests in FIG. 1 that the receiver in the head-end and the transmitter in the network units operate at 1.5 μm and the transmitter in the head-end and the receivers in the network units operate at 1.3 μm .

3. Claims 1-2, 4-5 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirngibl (U.S. Patent 5,550,666) in view of Rubinstain et al. (U.S. Patent 6,088,368).

Zirngibl discloses in FIG. 1 a data communication system comprising a distribution fiber 171, a splitter 165, a plurality of drop fiber 168, a head-end (central office) 130, a first optical network unit 190₁, and second optical network unit 190₂. The first network unit receives upstream data from 198₁ and modulates a subcarrier as described in col. 5, lines 12-13; the second network unit receives upstream data from 198₂ and modulates a subcarrier. Regarding claims 1-2 and 4-5, the difference between Zirngibl and the claimed invention is that Zirngibl does not teach to include Ethernet interface in the network unit to receive upstream data. Rubinstain et al. teaches in FIG. 3 an optical network unit with 10BaseS interface. As described in col. 6, lines 35-36, a 10BaseS interface is an Ethernet interface. One of ordinary skill in the art would have been motivated to combine the teaching of Rubinstain et al. with the data communication system of Zirngibl because Ethernet is commonly used for data interface at terminal equipment. Therefore, the use of Ethernet minimizes the need for protocol and data rate conversion. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Ethernet interface in the optical network unit for receiving upstream data, as taught by Rubinstain et al., in the data communication system of Zirngibl.

Rubinstain et al. suggests the use of high speed switch 154 in the optical network unit, which eliminates the possibility of collision.

Regarding claim 13, the central office transmits downstream data stream 141 to first and second network unit via the outside plant.

Regarding claims 14-15, the central office of FIG. 1 includes a transmitter 140, receiver 150 and wavelength-division multiplexing device 170; each network unit includes a transmitter 198, a receiver 195 and a wavelength-division multiplexing device 193. The receiver in the head-end and the transmitters in the network units, i.e., upstream signal, operate at 1.3 μm and the transmitter in the head-end and the receivers in the network units, i.e., downstream signal, operate at 1.5 μm as described in col. 2, lines 39-41.

4. Claims 7, 9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirngibl and Rubinstain et al. as applied to claims 1-2, 4-5 and 13-15 above, and further in view of Bodeep et al. (U.S. Patent 5,822,102).

Zirngibl and Rubinstain et al. have been discussed above in regard to claims 1-2, 4-5 and 13-15. Regarding claim 7, the difference between the modified data communication system of Zirngibl and Rubinstain et al. and the claimed invention is that Zirngibl does not show the details of the network unit even though it suggests the inclusion of a transmitter and a modulator in col. 8, line 66-col. 9, line 6. Bodeep et al. teaches the details of a network unit in FIG. 1, which includes adapter circuit 353, modulator 354 and transmitter 340. By modulating subcarriers of different frequencies allows different users to send upstream data simultaneously without collision. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was

made to include the adapter circuit, the modulator and the transmitter in the network units of the modified communication system of Zirngibl and Rubinstain et al., as taught by Bodeep et al., because the components are necessary for subcarrier multiplexing.

Regarding claim 9, Bodeep et al. teaches the use of QPSK modulation for upstream data in FIG. 4B, col. 1, line 35 and col. 3, lines 16-18.

Regarding claim 11, Zirngibl suggests the use of 1.3 μm for upstream signals.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. and Lewin et al. as applied to claims 1-2, 4-5, 7, 10 and 12-15 above, and further in view of Feldman (U.S. Patent 6,137,607).

Bohn et al. and Lewin et al. have been discussed above in regard to claims 1-2, 4-5, 7, 10 and 12-15. The difference between the modified data communication system of Bohn et al. and Lewin et al. and the claimed invention is that Bohn et al. and Lewin et al. do not include a bias control circuit. Feldman et al. describes the operation of the bias control 204 in col. 2, lines 60-67 such that the bias control circuit shuts off the laser (transmitter) in the absence of user data. One of ordinary skill in the art would have been motivated to combine the teaching of Feldman et al. with the modified data communication system of Bohn et al. and Lewin et al. because the bias control circuit eliminates optical beat interference (OBI) as described in col. 2, lines 60-61 of Feldman. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bias control circuit, as taught by Feldman et al., into the modified system of Bohn et al. and Lewin et al. to eliminate optical beat interference.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zirngibl, Rubinstain et al. and Bodeep et al. as applied to claims 7, 9 and 11 above, and further in view of Feldman (U.S. Patent 6,137,607).

Zirngibl, Rubinstain et al. and Bodeep et al. have been discussed above in regard to claims 7, 9 and 11. The difference between the modified data communication system of Zirngibl, Rubinstain et al. and Bodeep et al. and the claimed invention is that the network units of the modified communication system do not include a bias control circuit. Feldman et al. teaches the use of bias control for reducing optical beat interference as illustrated in FIG. 2. Feldman et al. describes the operation of the bias control 204 in col. 2, lines 60-67 such that the bias control circuit shuts off the laser (transmitter) in the absence of user data. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bias control circuit, as taught by Feldman et al., into the modified system of Zirngibl, Rubinstain et al. and Bodeep et al. to reduce optical beat interference.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. and Lewin et al. as applied to claims 1-2 above, and further in view of Sorrells et al. (U.S. Patent 6,542,722 B1).

Bohn et al. and Lewin et al. have been discussed above in regard to claims 1-2, 4-5, 7, 10 and 12-15. The difference between the modified data communication system of Bohn et al. and Lewin et al. and the claimed invention is the modulation method for upstream data. Bohn et al. suggests the use of FSK while the claimed invention uses QPSK. Sorrells et al. teaches in col. 11, lines 49-60 techniques for modulation. These different techniques for modulation are considered as equivalents and the choice of one

technique over the others depends on the particular application, e.g., the number of subscribers, data rate and cost. Where the claimed differences involve the substitution of interchangeable or replaceable equivalents and the reason for the selection of one equivalent for another was not to solve an existent problem, such substitution has been judicially determined to have been obvious. See *In re Ruff*, 118, USPQ 343 (CCPA 1958). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK as a modulation method, as taught by Sorrells et al., in the modified system of Bohn et al. and Lewin et al. as a design choice based on the particular application.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. and Lewin et al. as applied to claims 1-2 above, and further in view of Zirngibl (U.S. Patent 5,550,666).

Bohn et al. and Lewin et al. have been discussed above in regard to claims 1-2, 4-5, 7, 10 and 12-15. The difference between the modified data communication system of Bohn et al. and Lewin et al. and the claimed invention is the wavelength for the upstream data. Zirngibl teaches in col. 2, line 39-41 the use of 1.3 μm wavelength for upstream data. Certain optical fiber has a minimal absorption loss around 1.3 μm . Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use 1.3 μm wavelength for upstream data, as taught by Zirngibl, in the modified system of Bohn et al. and Lewin et al. because certain optical fiber has a minimal absorption loss at wavelength around 1.3 μm .

Response to Arguments

9. Applicant's arguments with respect to claims 1-2, 4-5 and 7-15 have been considered but are moot in view of the new ground(s) of rejection.

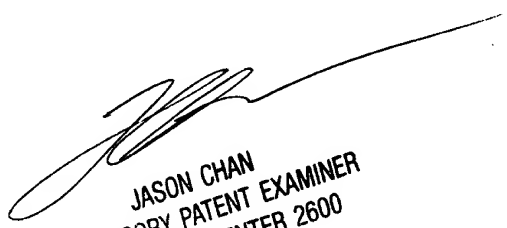
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl
July 25, 2003


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